



**QUEEN'S  
UNIVERSITY  
BELFAST**

## **What Musculoskeletal (MSK) Conditions are Referred from Routine General Practice (GP) and what Impact does this have on Developing Innovative Care Models for Patients with MSK Conditions in Primary Care?**

Heron, N., & Ryans, I. (2016). What Musculoskeletal (MSK) Conditions are Referred from Routine General Practice (GP) and what Impact does this have on Developing Innovative Care Models for Patients with MSK Conditions in Primary Care? *International Journal of Physical Medicine and Rehabilitation*, 4(375), [100375]. <https://doi.org/10.4172/2329-9096.1000375>

**Published in:**  
International Journal of Physical Medicine and Rehabilitation

**Document Version:**  
Publisher's PDF, also known as Version of record

**Queen's University Belfast - Research Portal:**  
[Link to publication record in Queen's University Belfast Research Portal](#)

**Publisher rights**  
© 2016 Heron N, et al. This is an open access article published under a Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the author and source are cited.

**General rights**  
Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**  
The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact [openaccess@qub.ac.uk](mailto:openaccess@qub.ac.uk).

## What Musculoskeletal (MSK) Conditions are Referred from Routine General Practice (GP) and what Impact does this have on Developing Innovative Care Models for Patients with MSK Conditions in Primary Care?

Neil Heron<sup>1,2\*</sup> and Ian Ryans<sup>1</sup>

<sup>1</sup>Centre for Public Health, School of Medicine, Dentistry and Biomedical Science, Institute of Clinical Science B, Royal Victoria Hospital, Queen's University Belfast, Room 01012, Grosvenor Road, Belfast BT12 6BA, UK

<sup>2</sup>UKCRC Centre of Excellence for Public Health (Northern Ireland), Institute of Clinical Science B, Royal Victoria Hospital, Grosvenor Road, Belfast BT12 6BA, UK

\*Corresponding author: Neil Heron, Level 4-Department of General Practice, Dunluce Health Centre, 1 Dunluce Avenue, Belfast, BT9 7HR, UK, Tel: 07917716425; E-mail: [nheron02@qub.ac.uk](mailto:nheron02@qub.ac.uk)

Received date: October 17, 2016; Accepted date: October 26, 2016; Published date: November 01, 2016

Copyright: © 2016 Heron N, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Introduction:** The current ethos within the United Kingdom (UK) health system is to encourage community management of health problems, increasing primary care workload. Yet General Practice (GP) is currently in 'crisis' with significant workload pressures. GP Federations have been developed to allow more collaborative working between GP practices and help develop new innovative models of care to better manage the GP workload pressures.

Musculoskeletal (MSK) conditions constitute approximately 20% of General Practice (GP) consultations and therefore the Belfast GP Federation aimed to assess the demand for MSK conditions to allow development of new primary care-based treatment pathways for these conditions. The aim of this paper is therefore to assess the demand for orthopaedic, rheumatology and chronic MSK painful conditions by assessing the referrals from 2 GP practices and the referrals to one orthopaedic Integrated Clinical Assessment and Treatment services (ICATs) clinic for these conditions and then propose innovative models of care to manage this demand within the community.

**Methods:** Secondary care referral rates for two urban GP surgeries in the Belfast area were assessed in April, 2016 to orthopaedics, rheumatology and chronic pain clinics. The referrals to an orthopaedic ICATs clinics, staffed by one GPwSI in MSK, in May 2016 were also reviewed. The orthopaedic ICATs team receive referrals from GPs regarding musculoskeletal conditions and this particular service is based in the Southern Trust area of Northern Ireland.

**Results:** Overall from the 2 GP surgeries there was 59 orthopaedic referrals, 11 to rheumatology and 3 to the chronic pain clinic. The commonest joint referred to the orthopaedic clinic was knee (15 referrals, 25.4%) and the commonest reason to refer to rheumatology was to exclude an inflammatory arthritis (6 referrals, 54.5%). There was then 25 referrals to ICATs, with the commonest reason for referral being neck (6 referrals, 24%) and back (4 referrals, 16%). The commonest treatment options employed within the ICAT service included joint injections (8 patients, 32%) with referral to in-house physiotherapy (8 patients, 32%).

**Conclusions:** UK GP is currently under significant workload pressures and musculoskeletal conditions, including orthopaedic, rheumatology and chronic painful conditions, make up a significant proportion of this workload. The main musculoskeletal areas which GPs are referring to secondary care include knee and spinal conditions. To help better manage this workload within primary care we propose developing a new community-based monthly musculoskeletal clinic based within local GP surgeries, supported by a MSK educational programme open to all GPs in the area. Outcomes which will be monitored from this quality improvement work will include secondary care referrals and maintaining high patient satisfaction as well as improving GP confidence in managing MSK conditions.

**Keywords:** Musculoskeletal; Primary care; Innovative care pathways; Reducing referrals

### What We Already Know

Musculoskeletal (MSK) conditions make up approximately 20% of the GP workload.

GPs often do not feel comfortable in managing MSK conditions and therefore a high referral burden to secondary care often results.

Within the UK health system, there is now an emphasis on shifting patient management from secondary and tertiary care into the community, with subsequent management pressures for community health workers, including GPs. New service models are needed to manage this demand.

### What This Study Adds

The main MSK areas which GPs are referring to secondary care include knee and spinal conditions.

The commonest community-based treatment options employed for MSK conditions are corticosteroid/local anaesthetic joint injections with advise regarding exercise prescription, which may or may not be with a physiotherapist.

To help better manage the MSK workload within primary care we propose developing a new community-based monthly MSK clinic based within local GP surgeries, supported by a MSK educational programme open to all GPs in the area.

## Introduction

Musculoskeletal (MSK) conditions make up a significant workload within general practice (GP), with one in seven GP consultations reported to be for MSK conditions [1]. The current ethos within the UK healthcare system is for a 'shift left' in patient management and within Northern Ireland there is the Transforming Your Care policy [2], with more and more medical conditions being managed within the community. Yet GP within the UK and in Northern Ireland is in 'crisis' [3,4], with significant workload pressures on those who work within the community and in the primary care team. The onus is therefore on those working within GP and the community to develop innovative models of care, breaking down the traditional barriers between primary and secondary care, allowing more effective management of the workload within primary care by developing integrative models of care. One way to do this is to invest in GP Federations [4,5], a GP Federation being a collection of practices and primary care teams who work together, "developing and delivering high quality, patient-focused services for their local communities" [4] delivering care to approximately 20 GP practices and 100,000 patients [5]. Such primary care investment and collective working is in keeping with the recent call from the Northern Ireland General Practitioners Committee of the British Medical Association (BMA) to better support NI GP and avert this 'crisis' [3].

With this in mind, the Belfast GP Federation has appointed 2 MSK clinical leads to develop innovative models of care for patients with orthopaedic, rheumatology and chronic MSK painful conditions. The first part of this role is therefore to assess the demand for these conditions within the community to allow the Federation to better plan the innovative models of care for musculoskeletal patients. The aim of this paper is therefore to assess the demand for orthopaedic, rheumatology and chronic MSK painful conditions by assessing the referrals from 2 GP practices and the referrals to one orthopaedic Integrated Clinical Assessment and Treatment services (ICATs) clinic for these conditions and then propose innovative models of care to manage this demand within the community.

## Methods

Secondary care MSK referral rates for two GP surgeries in the Belfast area were assessed in April, 2016 to orthopaedics, rheumatology and chronic pain clinics. Practice 1 serves a patient population of approximately 9,000 and has 5 GP partners and 1 salaried GP. Practice 2 serves a patient population of approximately 6,900 and has 3 GP partners and 1 salaried GP. Both practices use Egton Medical Information Systems (EMIS) computer systems, are urban GP surgeries and have one partner with a specialist interest in the area of primary care musculoskeletal conditions. The referrals to 5 orthopaedic ICATs clinics, staffed by one GPwSI in MSK, in May 2016 were also reviewed. The orthopaedic ICATs team receive referrals from GPs about patients with musculoskeletal conditions, being community-based clinics (straddling the divide between primary and secondary care) and this particular service serves the Southern Trust area of Northern Ireland. Within the ICATs service, the doctor can manage the patients themselves (e.g. with joint injections, exercise advice) or refer to colleagues within the service including extended-scope physiotherapists and podiatry. If the condition cannot be managed within the ICATs service then a secondary care referral will occur. For physiotherapy services, the patient can be referred to ICATs physiotherapy, which offers specialist musculoskeletal physiotherapy, or to 'core' physiotherapy which provides general physiotherapy services. No ethical approval was required for this study as it an audit of musculoskeletal conditions referred to secondary care.

## Results

### Practice 1 referrals

On reviewing referrals to orthopaedics, rheumatology and the pain clinics from this surgery in April 2016, there were 37, 4 and 0 referrals, respectively. The orthopaedic referrals (Table 1) included 9 for knee osteoarthritis, 6 with back pain, 5 paediatric cases (2 abnormal gaits with 1 each of clicking hip, suspected brachial plexus injury at 8 week check, and fixed flexion deformity of finger at 8 week assessment), 4 with neck pain, 3 hip osteoarthritis, 3 shoulder issues (confirmed bilateral rotator cuff tear, suspected bicipital tendonitis, and glenohumeral osteoarthritis), 2 acute knee injuries, and one each of trigger finger, trochanteric bursa, carpal tunnel syndrome, osteoporosis assessment and plantar fasciitis. The 4 rheumatology referrals (Table 2) included 2 to exclude an inflammatory arthritis and one each for carpal tunnel syndrome and steroid/local anaesthetic injections for widespread hand osteoarthritis.

Patient	Reason for referral	Notes	Ix to date	Treatment to date	Alternative options to referral
1	Left knee osteoarthritis (OA)-query need for replacement	Had been seen orthopaedic consultant on 2 occasions+course of physiotherapy	Knee X-ray-severe OA	Oral (PO) analgesia, ortho r/w, physio input.	Intra-articular (IA) steroid/local anesthesia (LA) injections.
2	Bilateral hip OA	-	Hip X-ray	PO analgesia, IA steroid/LA injections, physio	Nil
3	Bilateral knee OA-query need for replacement	-	Knee X-ray - severe OA	PO analgesia, physio, steroid/LA injections	Nil

4	Right knee osteoarthritis (OA)-query need for replacement	-	Knee X-ray-OA changes	PO analgesia, physio, IA steroid/LA injections	Nil
5	Sciatica	Physio requesting referral to ortho	-	PO analgesia, physio	Nil
6	L 3rd trigger finger-query need for steroid/LA injection	-	-	Nil	Injection in practice
7	Right carpal tunnel syndrome symptoms	GP querying need for steroid injection further investigation	-	Nil	Steroid injection in practice
8	Bilateral knee pains	Knee xray report-mild OA changes; ? osteochondritis dissecans defect in the medial femoral condyle with query loose body-advised referral for MRI	-	Po analgesia	Option-get MRI 1st-if confirmed xray findings, then refer on
9	Osteoporosis assessment	On PO steroids with diagnosis of RA	-	-	Refer for DEXA scan; blood profile in primary care; start vitamin D/calcium supplementation; start bisphosphonate if appropriate
10	Spinal stenosis on MRI of lumbar spine	-	MRI-spinal stenosis at L4-5, X-ray-OA changes, blood screen	PO analgesia, physio	Nil
11	Right knee osteoarthritis (OA)-query need for replacement	Also referred to falls clinic	Knee X-ray-OA changes	PO analgesia.	Physio referral, steroid/LA injection
12	Abnormal gait	5yo	Referred through GP but had already attended A&E	Nil	Referral rejected -? transient synovitis-refer if not settling/any concerns
13	Right arm abnormality in an 8 week old	Query brachial plexus nerve injury	Picked up at 8 week assessment by GP	Nil	Nil
14	Left knee pain	-	Referred for X-ray-no result available	PO analgesia, IA steroid/LA injection	Refer for IA steroid/LA injection and then course of physio first before referring to orthopaedics
15	Left knee injury 10 weeks ago-clinically left medial collateral ligament medial meniscus injury	No symptoms of locking or instability	Referred for X-ray	-	Xray and then acute management (POLICE) with follow-up before referring for physio
16	Right anterior shoulder/bicep pain	Shoulder ultrasound, shoulder and elbow X-ray normal	Referred-query cause of pain	PO analgesia, exercise advice	Nil
17	Neck pain - referred for query any injection therapies available	Neck X-ray-OA changes	-	PO analgesia; titrating up analgesic ladder	Refer to physio first
18	Acute neck pain after game of golf	-	Blood screen undertaken in GP	PO analgesia; already seen chiropractornad	Refer to physio first; titrate analgesia
19	Chronic neck pain-years	X-ray and MRI-mild oa changes	-	PO analgesia; physio	Nil
20	Neck pain with radiculopathy symptoms	X-ray showed advanced oa changes-referred for MRI and ortho r/w	-	PO analgesia	Refer to physio first with MRI referral

21	Right hip OA-query need for hip replacement	Right hip X-ray-advanced OA changes	-	PO analgesia, physio	Nil
22	Right trochanteric bursa	Referring for steroid/LA injection	-	PO analgesia	Steroid injection in practice physio referral
23	Left shoulder OA on X-ray-minor	-	-	-	Analgesia, steroid/LA injection, physio
24	Bilateral hip OA	Referring for query steroid/LA injections	-	Bilateral hip X-ray-OA changes	Steroid/LA injections in practice with physio therapy
25	Bilateral knee OA-query need for replacement	Bilateral knee X-ray-severe OA changes	-	Knee IA steroid/LA injections, physio	Nil
26	Right knee osteoarthritis (OA)-query need for replacement	X-ray-moderate OA changes	-	-	Knee steroid/LA injection in practice, physio
27	MRI-showed spinal stenosis, no focal neurology	-	-	-	PO analgesia and physio referral first with advice about red flags and when to seek urgent review
28	2 yr hx of sciatica with focal neurology reported	Previously had physio-no improvement	-	Lumbar spine xray-OA changes	Nil
29	Right knee osteoarthritis (OA)-query need for replacement	Previously had IA steroid/LA injections	Now on strong opiate meds. Declined physio	Right knee xray-severe OA changes	Nil
30	Back pain-had been told by orthopaedic consultant to be referred for steroid injection	-	-	-	Physio referral first with then onward referral if not settling
31	Twisting injury to left knee 8 weeks ago-? meniscal tear	Referred for X-ray	No locking or instability symptoms	-	Physio, PO analgesia- refer to orthopaedics if not settling
32	4 year old with 6 month history of clicking hip-maternal concerns	Hip X-ray-NAD	-	-	Nil
33	Referred as severe OA changes on xray of lumbar spine and sciatica symptoms-query need for MRI	X-ray of lumbar spine	-	-	Physio with or without MRI referral first
34	Bilateral rotator cuff tears -query need for operative repair	X-ray, U/S, analgesia, physio	Subacromial steroid injections	-	Nil
35	Left-sided plantar fasciitis symptoms	-	-	-	Steroid injections in practice and advise re stretches, etc
36	Change in gait, asymmetrical, in 1yo	-	-	-	Hip/pelvis xray pre-referral but would still need referral
37	Fixed flexion deformity of finger at 8 wk assessment	-	-	-	Nil

**Table 1:** Orthopaedic referrals from Practice 1.

Patient	Reason for referral	Notes	Ix to date	Treatment to date	Alternative options to referral
1	For carpal tunnel steroid injection		Nil recent	Carpal tunnel splint provided following recent A&E attendance, PO analgesia	Steroid injection in practice; consider inflammatory blood screen to exclude secondary causes
2	Query inflammatory arthritis	History of intermittent swollen joints + raised anti-chromatin level of 5.6	Inflammatory blood screen	PO analgesia	Also consider x-ray of appropriate areas with referral
3	Query need for IA hand steroid/LA injections	Had previously-worked well	Known psoriatic arthropathy	PO analgesia	Steroid/LA IA injection in practice
4	Query erosive arthritis changes seen on hand X-ray	Referred due to X-ray findings-query inflammatory arthritis			Nil

**Table 2:** Rheumatology referrals from Practice 1.

Alternative management options, which could have been considered in practice prior to the secondary care orthopaedic referral included 10 for local anesthetic/steroid injection with or without exercise advice, 10 for physiotherapy and 1 referral each for an MRI and osteoporosis management. Alternative management options for the rheumatology secondary care referrals were to consider steroid/local anaesthetic injections in the GP surgery for 2 of the referrals.

## Practice 2 referrals

On reviewing referrals to orthopaedics, rheumatology and the pain clinics from this surgery in April 2016, there were 22, 7 and 3 referrals,

respectively. The orthopaedic referrals (Table 3) included 6 for knee symptoms and 3 each for shoulder symptoms, foot pathology and paediatric cases (one each for flat feet, poor balance and unilateral tip-toe walking). There were then 2 referrals for carpal tunnel syndrome with one each for a wrist ganglion, back pain, neck pain, osteoporosis assessment, and lateral epicondylitis/tennis elbow. Whereas the rheumatology referrals (Table 4) included 4 to exclude an inflammatory arthritis and then 1 each for neck pain with radiculopathy, suspected fibromyalgia and complete supraspinatus tendon rupture in the shoulder. Finally, the 3 pain clinic referrals (Table 5) included 2 for chronic back pain and 1 for chronic neck pain.

Patient	Reason for referral	Notes	Ix to date	Treatment to date	Alternative options to referral
1	Ganglion to dorsum of right wrist	History of fibromyalgia	-	-	Aspirate/inject in practice
2	Left shoulder OA	Previously had shoulder steroid/LA injection which worked well	Shoulder X-ray- glenohumeral osteoarthritis	PO analgesia	Glenohumeral steroid/LA injection in practice physio
3	Low back pain	-	MRI-OA changes	PO analgesia	Physio with advice about red flag features and when to seek urgent review
4	Right knee pain-query meniscal pathology	History of right knee locking and giving way	Right knee X-ray - nad	Po analgesia	-
5	Left shoulder ultrasound-subacromial bursitis	-	Left shoulder ultrasound	Po analgesia	Subacromial steroid/LA injection in practice +/- physio
6	Right carpal tunnel syndrome	History of fibromyalgia	-	Given trial of amitriptyline	Steroid injection in practice hand splints
7	Right knee pain-recent MRI	No history of injury, locking or instability	MRI-meniscal tear, osteochondral defect, OA changes	PO analgesia	Consider physio referral first
8	6 year old referred for flat feet and issues with walking	Seen by podiatrist who had advised referral	-	-	Referral returned by orthopaedics - inappropriate referral-advised normal variant
9	1 year old with history of poor balance and falls-parental concern	-	-	-	Referral returned by orthopaedics - inappropriate referral-advised normal variant

10	Neck pain with radiculopathy symptoms	MRI-showed cervical disc prolapse	MRI	PO analgesia	Query physio first with pain management in practice
11	History of left knee locking for 2 months-patient can force the knee to straighten	X-ray-normal	-	PO analgesia	MRI, physio, with advice if acute locking -A&E
12	Referred for osteoporosis assessment	Had previous DEXA scan which advised repeat in 3 years	Bone scan-osteopenia	No t/ment to date-advised lifestyle measures.	Refer for DEXA scan; blood profile in primary care; start vitamin D/calcium supplementation; start bisphosphonate if appropriate
13	Left knee OA	Left knee X-ray-mild OA changes	X-ray	PO analgesia	Physio; activity modification; steroid/LA injection for pain
14	Right knee pain for 3 years following a twisting injury-query meniscal injury	No history of locking or instability	X-ray	PO analgesia	Physio 1st IA steroid/LA injection for pain; if not settling-orthopaedic referral
15	Right lateral epicondylitis	-	-	PO analgesia	Physio novel injection therapies, e.g. whole blood
16	Left shoulder pain-AC joint OA calcification within rotator cuff muscles	-	Left shoulder X-ray	Subacromial steroid injection; course of physio	For further subacromial steroid/LA injection and then refer if not settling
17	Unilateral tip-toe walking in 1 year old	-	-	-	-
18	Bilateral hallux valgus	-	X-ray	-	Podiatry referral first
19	Right carpal tunnel syndrome	-	Previously seen by rheumatology consultant-2 injections-advised if symptoms recur to have surgery	-	-
20	Foot pain, bilateral	History of bilateral talipes equinus varus, surgically corrected; previously had R calcaneal cuboid fusion	Previously seen by foot surgeon	X-ray	Query trial of podiatry first before referral back to foot surgeon
21	Left knee pain-no trauma	Left knee X-ray-nil; 53 years old	X-ray	PO analgesia	Physio IA steroid/LA injection
22	Right bunion (hallux valgus)	28 years old	Right foot X-ray	Nil	Podiatry first

**Table 3:** Orthopaedic referrals from Practice 2.

Patient	Reason for referral	Notes	Ix to date	Treatment to date	Alternative options to referral
1	Query inflammatory arthritis	-	Inflammatory blood screen; X-ray-DIP 2nd finger swelling	PO analgesia	-
2	Query inflammatory arthritis	History of Raynaud's; anti-Ro +ve	-	Po analgesia	-
3	Neck pain-MRI shows prolapsed discs	-	MRI	PO analgesia	Refer to physio first
4	Widespread pain-suspected fibromyalgia	-	Inflammatory blood screen-normal	Po analgesia	Physio; pain management



5	Joint erosions seen on X-ray – query inflammatory arthropathy	-	X-ray, inflammatory blood screen	PO analgesia	-
6	History of psoriasis and joint erosions seen on hand X-ray	-	X-ray, inflammatory blood screen	Po analgesia	-
7	Right shoulder pain	-	Right shoulder X-ray-normal; right shoulder U/S – complete rupture of supraspinatus	Po analgesia, physio, x3 steroid injections	Shoulder orthopaedic surgeon

**Table 4:** Rheumatology referrals from Practice 2.

Patient	Reason for referral	Notes	Ix to date	Treatment to date	Alternative options
1	Chronic back pain-recent decompression surgery	-	X-ray, MRI-OA changes	Orthopaedic input; on gabapentin, naproxen	Titration of pain meds in practice; pain management techniques
2	Chronic back pain with radiation down right leg	-	X-ray-OA changes	Started on gabapentin	Titration of pain meds in practice; pain management techniques
3	Chronic neck pain with radiculopathy	-	X-ray, MRI-OA changes	Started on co-codamol 30/500; diazepam	Titration of pain meds in practice; pain management techniques

**Table 5:** Chronic Pain Clinic referrals from Practice 2.

Alternative management options which could have been considered in practice prior to the secondary care orthopaedic referrals included 7 for local anaesthetic/steroid injection with or without exercise advice, 5 for physiotherapy, 3 for podiatry and 1 osteoporosis assessment. Whereas the alternative to rheumatology secondary care referrals included 2 to physiotherapy and 1 to the orthopaedic shoulder consultant to consider operative repair of the complete rotator cuff tear. Finally, the chronic pain referrals could have been alternatively managed with in-house analgesic titration with a pain management course/techniques.

### Orthopaedic ICAT clinic referrals

There were 25 referrals (Table 6) to orthopaedic ICATs received in May 2016 to one GPwSI, managed over 5 clinics. The presenting issue

included 6 with neck pain and 4 each of back pain, hip pain and carpal tunnel syndrome. There were then 2 referrals each for trigger finger and shoulder symptoms with one each for neck pain, Dupuytren's contracture and wrist pain. Treatment within the ICATs service included 8 receiving steroid/local anaesthetic injections to the affected area with or without exercise prescription, 8 referred to the ICATs physio, with 3 referred to core physiotherapy. Two patients were also referred for an MRI of the affected area with one patient each receiving an ultrasound guided steroid/local anaesthetic injection, hand splints and exercise prescription with advice about their condition. Only 4 patients were referred onwards from the ICATs service, with 3 referred to core physiotherapy and 1 for an ultrasound guided steroid/local anaesthetic injection.

Patient	Referral reason	Investigations	Management in ortho ICATs	Onward referral from ICATs
1	Left knee OA	Left knee X-ray-OA changes	Steroid/LA IA knee injection; walking stick	No
2	Back pain/sciatica	Nil	Core physio referral; trial of neuropathic analgesic (e.g. amitriptyline)	Yes-core physio
3	Right hip pain-suspected labral tear	MRI with contrast	Suspected right labral hip tear trochanteric bursitis of right hip; referred to ICATs physio	No
4	Neck pain	MRI-normal	Normal MRI; patient reporting neck pain with radiation down arm; trial of neuropathic analgesia	Yes-core physio
5	Thoracic back pain	MRI-degenerative changes at T7-T8	Advised re appropriate strengthening exercises for back and referred to ICATs physio for input	No
6	Right carpal tunnel syndrome	Nil	Carpal tunnel steroid injection; splints	No
7	Right middle trigger finger	Referred for ultrasound guided steroid injection as nodule palpable on the tendon	Referred for u/s guided steroid injection	Yes-u/s guided steroid injection



8	Twisting injury to right knee approx. 9 months ago	Referred for MRI - ? meniscus ACL injury	MRI referral; ICATs physio	Yes-MRI referral for right knee
9	Recurrent left patella dislocation	Left knee X-ray-normal	Referred for ICATs physio and advised re core stability	No
10	Bilateral Dupuytren's contracture of hands, right greater than left	Nil	Conservative management advised as flexion contracture mild (<20 degrees) and not interfering with activities of daily living	No
11	Left knee pain; MRI showed a medial meniscal tear and chondromalacia patellae	No history of locking or instability	Titration of PO analgesia and referred to ICATs physio for appropriate quadriceps, hamstring and gluteal strengthening exercises	No
12	U/S of left shoulder showed rotator cuff tendonitis and subacromial bursitis	-	Subacromial steroid/LA injection into L shoulder and referred to ICATs physio	No
13	Right carpal tunnel syndrome and Dupuytren's contracture	Nil	Right carpal tunnel steroid injection; night splints; conservative management of Dupuytren's contracture	No
14	Bilateral carpal tunnel syndrome, left>right	Nil	Trial of night splints; if no improvement – steroid injection	No
15	Bilateral hip OA and bilateral shoulder impingement, right>left	Hip X-ray-OA changes	Steroid/LA injection to right hip and then input from ICATs physio; own GP had already referred for bilateral U/S guided subacromial steroid/LA injections	No
16	82 year old man with 3 week history of back pain and past history of prostate carcinoma	Referred for MRI of lumbar spine due to hx of prostate ca	Trial of neuropathic agent (amitriptyline); advised regarding core stability exercises and referred to ICATs physio for input	No
17	12 year history of bilateral anterior patellofemoral knee pain, right>left	Bilateral xray of knees - nil	Advised regarding core stability, particularly quadriceps, hamstring and gluteal strengthening exercises; then referred to ICATs physio to support this	No
18	Left subacromial shoulder impingement	Left shoulder X-ray - nil	Left subacromial steroid/LA injection; advised re rotator cuff strengthening exercises and then referred to ICATs physio for input	No
19	Bilateral hip pain, right>left	Bilateral hip/pelvis X-ray - nad	Tight hip flexors and poor lumbar spine mobility- referred to ICATs physio	No
20	Chronic lumbar back pain	MRI-degenerative changes with potential for nerve root impingement	Trial of neuropathic analgesia; core stability exercise advice and referred to ICATs physio to support	No
21	Bilateral hip pain, left>right	X-ray-OA changes	Exercise prescription and general advice about osteoarthritis as a condition	No
22	Left-sided ulna wrist pain. Had been referred by core physio after course of physio and x2 steroid/LA into wrist joint.	X-ray of wrist-oa changes, particularly at the radiocarpal joints.	-	Yes - referred for MRI-query triangular fibrocartilage injury
23	Right 5th trigger finger	Nil	Blind injection of steroid/LA around palpable nodule at MCP area	No
24	Bilateral carpal tunnel syndrome, left> right	Nil	Steroid injection to L carpal tunnel with night splints	No
25	Left knee pain-OA changes on X-ray	MRI done to exclude meniscal injury	Physio for core strengthening exercises IA steroid/LA injection if not settling	No

**Table 6:** Orthopaedic ICAT referrals.

## Discussion

Musculoskeletal conditions, including orthopaedic, rheumatology and chronic painful conditions, make up a significant workload for routine GP. Through the analysis which has been performed, it can be seen that knee and hip conditions, particularly osteoarthritis affecting these areas, as well as back and neck pain, shoulder, foot and paediatric orthopaedic pathology are common reasons for onward referral from GP to secondary care. Other common reasons for referral include carpal tunnel syndrome, trigger fingers and the need to exclude an inflammatory arthritis. Common treatment options for these musculoskeletal conditions include steroid/local anesthetic injections to the affected area, exercise prescription with or without physiotherapy input, pain management and information sharing about their condition to enable patient empowerment.

## Prevalence of MSK conditions in primary care

The main joint being referred from primary care in this project was knee, with the commonest pathology detected here being osteoarthritis. This finding is in keeping with previous authors [1] who found the knee and back to be the commonest body regions presenting in GP patients with MSK symptoms. Although other authors reported the back and neck regions as the commonest presenting areas for MSK conditions in primary care [6]. This difference may be explained by the fact that our study is looking at the MSK referrals from practice and not simply reporting the MSK conditions presenting to routine GP. The GPs may therefore be filtering out these other musculoskeletal presentations within their own clinics.

## Future plans-quality improvement project to manage MSK conditions in primary care

From this analysis, to help reduce secondary care referrals for musculoskeletal conditions as well as better manage the workload in primary care from musculoskeletal conditions, 2 options have been proposed. The options have included a monthly specialist musculoskeletal clinic based within the local GP surgeries to run alongside an ongoing educational programme to generally up-skill GPs on musculoskeletal conditions. The next step for developing the monthly specialist musculoskeletal clinic within the GP surgery is to pilot this within 10 local surgeries. The clinic would accept referrals for chronic conditions, including shoulder pathology (adhesive capsulitis, shoulder impingement, acromioclavicular (AC) joint symptoms), knee (with symptoms of locking or instability to be referred directly to orthopaedics), hand (carpal tunnel syndrome, trigger finger, 1st carpometacarpal osteoarthritis, de Quervain's tenosynovitis), elbow (lateral and medial epicondylitis) and a chronic pain management programme. Prior to referral, treatment pathways for common musculoskeletal conditions will be available for the GPs to refer to and the referrer should consider an X-ray of the affected joint with or without an appropriate inflammatory blood screen if clinically indicated. This clinic will be staffed by a local GP with a specialist interest in musculoskeletal conditions with access to physiotherapy, pharmacy, podiatry, psychology and musculoskeletal ultrasound imaging. This approach has been previously trialed with significant success in reducing onward secondary care referrals for musculoskeletal conditions and radiology referrals as well as providing high patient satisfaction, although this approach was only piloted in one surgery [7,8]. This innovative community based musculoskeletal clinic would then be supported by a monthly education programme on common musculoskeletal conditions seen within primary care and

open to any GP within the Belfast GP Federation to attend. Outcomes which will then be monitored from this quality improvement project will include onward secondary care referrals from the practice and patient satisfaction with the new service as well as improving GP confidence in managing musculoskeletal conditions.

## Potential limitations

This is a review of 2 practices' referrals to orthopaedics, rheumatology and chronic pain clinics over one month along with a review of orthopaedic ICAT referrals to one doctor over one month period. The review therefore may be influenced by the practices and the GPwSI which were reviewed as well as the month of the year which the review was performed. In particular, both practices already had a GP with a specialist interest in MSK conditions working in the practice and the referrals for these conditions may therefore be low compared to GP surgeries without access to such a resource. The review of referrals from the practices is dependent on appropriate coding and the data is therefore limited by the statistics provided to us, which may lead to under- or over-estimating of referral rates.

## Conclusion

Primary care and GP within the UK is currently under significant workload pressures and musculoskeletal conditions, including orthopaedic, rheumatology and chronic painful conditions, make up a significant proportion of this workload. The main musculoskeletal areas which GPs are referring to secondary care include hip and knee conditions, soinal conditions, shoulder and hand pathology, including carpal tunnel syndrome and trigger finger. To help better manage this workload within primary care we propose developing a new community-based monthly musculoskeletal clinic based within local GP surgeries, led by local GPs, supported by a MSK educational programme open to all GPs in the area. Outcomes which we will be monitored from this quality improvement work will include secondary care referrals and maintaining high patient satisfaction as well as improving GP confidence in managing MSK conditions.

## Acknowledgment

The authors wish to acknowledge the Belfast GP Federation for their help throughout this project. This project could not have been completed without the support of all staff at the 2 GP surgeries as well as at orthopaedic ICATs, Southern Trust and therefore a big thank you must go to them.

## Funding

This work was not supported by any external funding.

## References

1. Jordan K, Kadam U, Hayward R, Porcheret M, Young C, et al. (2010) Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. *BMC musculoskeletal disorders* 11: 144.
2. <https://www.health-ni.gov.uk/>
3. BMA (2015) General Practice in Crisis-A Report on Primary Care in Northern Ireland. British Medical Association.
4. Royal College of General Practitioners (2015) Delivering Change for General Practice: A Strategy for Improving Patient Care in Northern Ireland. RCGP NI.

- 
5. BMA (2015) General Practice in Northern Ireland: The Case for Change. British Medical Association.
  6. Goff I, Wise E, Coady D, Walker D (2014) Musculoskeletal training: are GP trainees exposed to the right case mix for independent practice? Clin Rheumatol 35: 507-511.
  7. Heron N (2015) Musculoskeletal (MSK) and Sport and Exercise Medicine (SEM) in General Practice (GP): A Novel GP-based MSK and SEM Clinic for Managing Musculoskeletal symptoms in a GP. BMJ Qual Improv Report 4.
  8. Heron N (2015) A 'novel' model for integrating Sport and Exercise Medicine (SEM) and Musculoskeletal(MSK) management into primary care in the UK. BMJ Open Sport Exerc Med 1: e000027.